

CHRISTINE O. GREGOIRE
Director



STATE OF WASHINGTON

DEPARTMENT OF ECOLOGY

7171 Cleanwater Lane, Building 8, LH-14 • Olympia, Washington 98504

April 27, 1990

TO: Mike Gallagher
 FROM: Laura Chern
 SUBJECT: Toftdahl Drum Site Monitoring Round One

SUMMARY

The Toxics Investigations/Ground Water Monitoring Section collected ground water samples on October 17, 1989, as part of routine monitoring at the Toftdahl Drum site. Sample analyses showed low concentrations of copper and zinc in domestic wells. Metals concentrations did not exceed draft EPA drinking water standards.

INTRODUCTION

Objectives

The Toxics Investigations/Ground Water Monitoring Section was requested by the Hazardous Waste Investigations and Cleanup Program (HWICP) to monitor ground water at the Toftdahl Drum Site on a bi-annual basis. Monitoring objectives are as follows:

1. Provide routine ground water monitoring data as required by the federally mandated Record of Decision (ROD);
2. Provide HWICP with data to possibly explain past sporadic detection of poly-aromatic hydrocarbons (PAHs), polychlorinated biphenyls (PCBs), volatile organic compounds (VOCs), and semi-volatile organic compounds (BNAs);
3. Characterize ground water quality; and
4. Determine future sampling needs.

In addition, the Ginter well (Figure 1) was sampled for priority pollutant metals to determine if lead weights, inadvertently dropped down the well during a previous Ecology investigation, are affecting ground water quality.

SITE BACKGROUND

In the early 1970s, drums containing unknown quantities and types of waste were cleaned for resale on the Toftdahl property. The drums allegedly contained industrial wastes from a plywood manufacturing facility. It is

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estimated that between 100 and 200 drums were cleaned onsite. Approximately 50 drums contained residual wastes and could not be sold. These drums were buried on site (see Figure 1). In 1985, the buried drums and wastes were removed. A Remedial Investigation conducted after drum removal concluded that no evidence of significant soil or ground water contamination existed. Low concentrations of PAHs, PCBs, VOCs and BNAs were detected sporadically in nearby domestic water supply wells. The Record of Decision (ROD) prepared for the Toftdahl site requires ground water monitoring on a semi-annual basis for five years, and annually for ten years. In 1989, the site was delisted from the National Priorities List.

METHODS

Ground Water Sampling

Figure 1 shows locations of domestic wells sampled and the direction of ground water flow. Prior to sample collection, domestic water systems were purged by allowing taps to run until stable pH, specific conductivity, and temperature values were obtained. Samples were collected from the tap closest to the well head. Wells were sampled from upgradient to downgradient. All wells were sampled for VOCs, BNAs, PCBs, pesticides, cyanide, and total priority pollutant metals. Metal samples were preserved with 1 mL of concentrated nitric acid to a pH≤2.

Quality Assurance Samples

A duplicate sample and transport blank were submitted. Matrix spikes, matrix spike duplicates, and method blanks were analyzed for all parameters.

SAMPLE ANALYTICAL RESULTS

Sample analytical results are presented in Appendix A. Data are stored in the ENVIS database. Table 1 is a summary of contaminants found in sampling round one and a previous round of sampling conducted September 12, 1988, by Ecology. Copper, zinc and mercury were present in down-gradient wells at concentrations well below EPA draft drinking water standards. Mercury was found in the transport blank at higher concentrations than in either sample where it was detected. Matrix spikes, matrix spike duplicates, and method blanks were within contract laboratory program limits. Duplicate samples from the Tom domestic well (labeled East) showed similar analytical results.

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Table 1: Summary of Sampling Results from September 1988 and October 1989.

Location	pH	Temperature (degree C)	10/17/89			9/12/88		
			Specific Conduct.	Copper (mg/L)	Zinc (mg/L)	Mercury (ug/L)	Copper (mg/L)	Zinc (mg/L)
Homala	6.72	10.0	89	ND	.02	.16B	NA	NA
Bedoff	6.92	10.9	125	.05	ND	ND	.12	ND
Kyle	6.63	10.3	86	.03	.02	.10B	.04	.05
Boone	6.84	11.8	110	.05	.29	ND	.08	.39
Tom	6.68	12.4	93	.01	.01	ND	.03	.1
East	--	--	--	ND	.02	ND	NA	NA
Ginter	6.83	11.8	112	ND	ND	ND	NA	NA
Transport Detection Limits				ND	ND	.22	NA	NA
Draft Drinking Water Standards			.01	.01	.06	.01	.01	.06
NA: Not applicable. ND: Not detected at limits shown. B: Concentration detected less than that detected in the transport blank.	NA	NA	2	NA	NA	2		

DISCUSSION AND CONCLUSIONS

Volatile and semi-volatile compounds, cyanide, pesticides and polychlorinated biphenyls analyses showed no detectable levels of contaminants in ground water samples (See Appendix A). Priority pollutant metals analyses showed detectable concentrations of copper and zinc. All analyses were well below EPA draft drinking water standards.

RECOMMENDATIONS

1. To determine if sampling should continue on an annual rather than semi-annual basis, an additional round of sampling should be conducted for priority pollutants and priority pollutant metals.
2. Downgradient wells Bedoff, Homala, and Kyle and upgradient well Boone should continue to be sampled for priority pollutants and priority pollutant metals annually. Based on data presented in this report, sampling at the Tom and Ginter wells should be discontinued.

LC:krc
cc: Bill Yake

Appendix A

State of Washington Department of Ecology
Manchester Environmental Laboratory
P.O Box 307 Manchester, WA. 98353

Data Review

December 4, 1989

Project : Tofdahl

Samples : 428020 428021 428022 428023 428024
 428025 428026 428027

Laboratory: Laucks Testing Laboratories 10122

By: Stuart Magoon *SM*

VOA Fraction (water)

Holding Times:

Sample	Date Collect	Date Man Lab Rec'd	Date Cntr Lab Rec'd	Date Extd	Date Anlz	#Days From Collect
428020	10/16	10/17	10/18	NA	10/19	3 of 14
428021	10/16	10/17	10/18	NA	10/19	3 of 14
428022	10/16	10/17	10/18	NA	10/19	3 of 14
428023	10/16	10/17	10/18	NA	10/19	3 of 14
428024	10/16	10/17	10/18	NA	10/19	3 of 14
428025	10/16	10/17	10/18	NA	10/19	3 of 14
428026	10/16	10/17	10/18	NA	10/19	3 of 14
428027	10/16	10/17	10/18	NA	10/19	3 of 14

These samples have met all the CLP holding time requirements.

Surrogates: Surrogate recoveries for this sample, matrix spikes, and the method blanks are within the CLP recovery limits.

Matrix Spike & Matrix Spike Duplicate (MS/MSD): Matrix spike/spike duplicate recoveries and precision data are acceptable and within CLP limits.

Sample Data This data is acceptable for use. Note that data which is flagged with data qualifiers will modify the usefulness of the individual values.

TO: Washington Department of Ecology
Project Name: Toftdahl
Laboratory No.: 8910122
Date of this report: November 28, 1989

The following samples were analyzed under the above laboratory number:

<u>Client I.D.</u>	<u>Lab I.D.</u>	<u>Analysis Requested</u>
428020	8910122-1	VOA
428021	8910122-2	VOA
428022	8910122-3	VOA
428023	8910122-4	VOA
428024	8910122-5	VOA
428026	8910122-6	VOA
428027	8910122-7	VOA

GENERAL REMARKS ON ORGANIC ANALYSES:

GC/MS Fractions:

Compounds may be called out as hits on the computerized printout. However, if they are not reported on the OADS (sample results) form, the mass spectral data have been manually searched and the compounds have been eliminated as hits based on this search.

Volatile Fraction:

All volatile analyses were performed using a DB-624 megabore capillary. The elution order and retention times differ from those stated for packed column analysis in the U.S.E.P.A.'s Statement of Work for organic CLP analyses. Listed below are the correct elution order and the internal standard with which each compound is associated.

<u>Bromochloromethane (IS)</u>	<u>1,4-Difluorobenzene (IS)</u>	<u>d5-Chlorobenzene (IS)</u>
Chloromethane	Benzene	4-Methyl-2-Pentanone
Vinyl Chloride	Trichloroethylene	Toluene
Bromomethane	1,2-Dichloropropane	d8-Toluene (SURR)
Chloroethane	Bromodichloromethane	Trans-1,3-Dichloropropene
1,1-Dichloroethylene	Cis-1,3-Dichloropropene	1,1,2-Trichloroethane
Acetone		Tetrachloroethylene
Carbon Disulfide		2-Hexanone
Methylene Chloride		Dibromochloromethane
Trans-1,2-Dichloroethylene		Chlorobenzene
1,1-Dichloroethane		Ethylbenzene

Vinyl Acetate	Styrene
Cis-1,2-Dichloroethylene	M,P-Xylene
2-Butanone	O-xylene
Chloroform	Bromoform
1,1,1-Trichloroethane	1,1,2,2-Tetrachloroethane
Carbon Tetrachloride	Bromofluorobenzene(SURR)
1,2-Dichloroethane	
d4-1,2-Dichloroethane(SURR)	

The analytes listed above were assigned to their respective internal standards on the basis of relative retention time (RRT). For all compounds except cis-1,3-dichloropropene, the RRTs fall between 0.8 and 1.2. Cis-1,2-dichloropropene was the only compound to fall outside of this range, and was assigned to the internal standard closest to its retention time.

Separation of cis- and trans- dichloroethylene isomers is achievable on a DB-624 megabore capillary column. These compounds have been found to coelute on the packed column specified in the U.S.E.P.A.'s Statement of Work. When these isomers are found in a sample, they will be reported as total-1,2-dichloroethylene.

A holding blank was analyzed in the same QC period with the samples from this set. The raw data were not submitted with the case. It will be held on file at Laucks should future review be necessary.

SPECIFIC REMARKS ON ORGANIC ANALYSES:

VOA Fraction:

No comment.

RELEASE OF DATA

Release of the data contained in this hardcopy data package and in the computer-readable data submitted on floppy diskette (if requested) has been authorized by the Laboratory Manager or his designee, as verified by the following signatures.

Respectfully submitted,


Barbara Gleason
Operations Manager
11-28-89
(date)


Mike Nelson
Chief Chemist
11/28/89
(date)

SA
WATER VOLATILE SURROGATE RECOVERY

Lab Name. Laucks Testing Labs Contract: _____

Lab Code. LAUCKS Case No.: _____ SAS No.: _____ SDG No.: 42802

	SAMPLE NO.	S1 (TOL) #	S2 (BFB) #	S3 (DCE) #	OTHER	TOT
		=====	=====	=====	=====	OUT
01	VBLKJ1	102	101	95	-----	0
02	428020	104	102	97	-----	0
03	428021	103	103	98	-----	0
04	428022	102	100	95	-----	0
05	428023	99	98	95	-----	0
06	428024	100	97	93	-----	0
07	428025	104	101	93	-----	0
08	428027	100	102	98	-----	0
09	428023MS	107	105	97	-----	0
10	428023MSD	104	100	95	-----	0
11	-----	-----	-----	-----	-----	-----
12	-----	-----	-----	-----	-----	-----
13	-----	-----	-----	-----	-----	-----
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QC LIMITS

S1 (TOL) = Toluene-d8 (88-110)

S2 (BFB) = Bromofluorobenzene (86-115)

S3 (DCE) = 1,2-Dichloroethane-d4 (76-114)

Column to be used to flag recovery values

* Values outside of contract required QC limits

D Surrogates diluted out

CA
WATER VOLATILE MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

Lab Name: Laucks Testing Labs Contract: -----

Lab Code: LAUCKS Case No.: ----- SAS No.: ----- SOG No.: 42802

Matrix Spike ----- Sample No.: 428023

COMPOUND	SPIKE ADDED (ug/L)	SAMPLE CONCENTRATION (ug/L)	MS CONCENTRATION (ug/L)	MS %	QC REC #	LIMITS REC.
1,1-Dichloroethene	50.000	0.000	47.600	95	-	61-145
Trichloroethene	50.000	0.000	46.500	93	-	71-120
Benzene	50.000	0.000	45.400	91	-	76-127
Toluene	50.000	0.000	47.800	96	-	76-125
Chlorobenzene	50.000	0.000	45.900	92	-	75-130

COMPOUND	SPIKE ADDED (ug/L)	MSD CONCENTRATION (ug/L)	MSD %	%	QC LIMTS RPD #	RPD REC.
1,1-Dichloroethene	50.000	48.800	94	-2	-	14
Trichloroethene	50.000	43.700	87	-6	-	14
Benzene	50.000	45.400	91	-0	-	11
Toluene	50.000	47.000	94	-2	-	13
Chlorobenzene	50.000	45.000	90	-2	-	13

* Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

RPD:0 out of 5 outside limits

Spike Recovery:0 out of 10 outside limits

Comments: -----

CA
VOLATILE METHOD BLANK SUMMARY

Lab Name. Laucks Testing Labs Contract. _____

Lab Code: LAUCKS Case No.: _____ SAS No.: _____ SCD No.. 42802

Lab File ID. B1019MVOWJ1 Lab Sample ID. B1019MVOWJ1

Date Analyzed: 10/19/89 Time Analyzed: 13.32

Matrix: (soil/water) WATER Level:(low/med) LOW

Instrument ID: 1020J

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS, AND MSD:

SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	TIME ANALYZED
01 428020	10122-01A	10122V01	14:10
02 428021	10122-02A	10122V02	14:48
03 428022	10122-03A	10122V03	15:26
04 428023	10122-04A	10122V04	16:03
05 428024	10122-05A	10122V05	16:42
06 428026	10122-06A	10122V06	17:20
07 428027	10122-07A	10122V07	17:59
08 428023MS	10122-04AMS	10122V04MS	18:39
09 428023MSD	10122-04AMSD	10122V04MSD	19:18
10			
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COMMENTS: _____

IA
VOLATILE ORGANICS ANALYSIS DATA SHEET

SAMPLE NO.

Lab Name: Laucks Testing Labs Contract: _____ |428020|
 Lab Name: Laucks Testing Labs Contract: _____ |Benzene|
 Lab Code: LAUCKS Case No.: _____ SAS No. _____ DOG No.: 42802
 Matrix: (soil/water)WATER Lab Sample ID: 10122-01A
 Sample wt/vol. 5.0 (g/ml)ML Lab File ID: 10122V01
 Level: (low/med) LOW Date Received: 10/18/89
 Moisture: not dec. Date Analyzed: 10/19/89
 Column: (pack/cap) CAP Dilution Factor: 1

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg)UG/L	Q
74-87-3	Chloromethane	10 U	
74-83-9	Bromomethane	10 U	
75-01-4	Vinyl Chloride	10 U	
75-00-3	Chloroethane	10 U	
75-09-2	Methylene Chloride	5 U	
57-64-1	Acetone	10 U	
75-15-0	Carbon Disulfide	5 U	
75-35-4	1,1-Dichloroethene	5 U	
75-34-3	1,1-Dichloroethane	5 U	
540-59-0	1,2-Dichloroethene (total)	5 U	
67-56-3	Chloroform	5 U	
107-06-2	1,2-Dichloroethane	5 U	
70-93-0	2-Butanone	10 U	
71-55-6	1,1,1-Trichloroethane	5 U	
56-20-5	Carbon Tetrachloride	5 U	
108-05-4	Vinyl Acetate	10 U	
75-27-4	Bromodichloromethane	5 U	
78-37-5	1,2-Dichloropropane	5 U	
10061-01-5	cis-1,3-Dichloropropene	5 U	
79-01-6	Trichloroethene	5 U	
124-48-1	Dibromochloromethane	5 U	
79-00-5	1,1,2-Trichloroethane	5 U	
71-43-2	Benzene	5 U	
10061-02-6	Trans-1,3-Dichloropropene	5 U	
75-25-2	Bromoform	5 U	
108-10-1	4-Methyl-2-Pentanone	10 U	
591-78-6	2-Hexanone	10 U	
127-18-4	Tetrachloroethene	5 U	
79-34-5	1,1,2,2-Tetrachloroethane	5 U	
108-88-3	Toluene	5 U	
108-90-7	Chlorobenzene	5 U	
100-41-4	Ethylbenzene	5 U	
100-42-5	Styrene	5 U	
1330-20-7	Xylene (total)	5 U	

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

SAMPLE NO.

Lab Name:	Laucks Testing Labs	Contract:	428020
Lab Code:	LAUCKS	Case No.:	SAS No.: 42802
Matrix:	(soil/water)WATER	Lab Sample ID: 10122-01A	
Sample wt/vol:	5.0 (g/ml)ML	Lab File ID: 10122V01	
Level:	(low/med) LOW	Date Received: 10/18/89	
% Moisture, not dec.:		Date Analyzed: 10/19/89	
Column:	(pack/cap) CAP	Dilution Factor: 1.0	

CONCENTRATION UNITS:
(ug/L or ug/Kg)UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
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1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

SAMPLE NO.

Lab Name. Laucks Testing Labs Contract: _____ | 428021 | Tom |

Lab Code. LAUCKS Case No.: _____ SAS No. _____ SOG No..42802

Matrix. (soil/water)WATER Lab Sample ID: 10122-02A

Sample wt/vol. 5.0 (g/ml)ML Lab File ID. 10122V02

Level: (low/med) LOW Date Received: 10/18/89

% Moisture. not dec. ____ Date Analyzed: 10/19/89

Column. (pack/cap) CAP Dilution Factor: 1

CAS NO.	COMPOUND	CONCENTRATION UNITS:	
		(ug/L or ug/Kg)UG/L	Q
74-87-0	Chloromethane	10	U
74-80-9	Bromomethane	10	U
75-01-4	Vinyl Chloride	10	U
75-00-3	Chloroethane	10	U
75-09-2	Methylene Chloride	5	U
57-64-1	Acetone	10	U
75-15-0	Carbon Disulfide	5	U
75-35-4	1,1-Dichloroethene	5	U
75-34-3	1,1-Dichloroethane	5	U
540-59-0	1,2-Dichloroethene (total)	5	U
67-66-3	Chloroform	5	U
107-06-2	1,2-Dichloroethane	5	U
78-60-0	2-Butanone	10	U
71-55-6	1,1,1-Trichloroethane	5	U
56-20-5	Carbon Tetrachloride	5	U
108-05-4	Vinyl Acetate	10	U
75-27-4	Bromodichloromethane	5	U
78-37-5	1,2-Dichloropropane	5	U
10051-01-5	cis-1,3-Dichloropropene	5	U
79-01-6	Trichloroethene	5	U
124-48-1	Dibromochloromethane	5	U
79-00-5	1,1,2-Trichloroethane	5	U
71-43-2	Benzene	5	U
10061-02-6	Trans-1,3-Dichloropropene	5	U
75-25-2	Bromoform	5	U
108-10-1	4-Methyl-2-Pentanone	10	U
591-78-6	2-Hexanone	10	U
127-18-4	Tetrachloroethene	5	U
79-34-5	1,1,2,2-Tetrachloroethane	5	U
108-88-3	Toluene	5	U
108-90-7	Chlorobenzene	5	U
100-41-4	Ethylbenzene	5	U
100-42-5	Styrene	5	U
1330-20-7	Xylene (total)	5	U

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VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

SAMPLE NO.

Lab Name: Laucks Testing Labs Contract: _____

428021

TOM

Lab Code: LAUCKS Case No.: _____ SAS No.: _____ SDG No.: 42802

Matrix: (soil/water)WATER Lab Sample ID: 10122-02A

Sample wt/vol: 5.0 (g/ml)ML Lab File ID: 10122V02

Level: (low/med) LOW Date Received: 10/18/89

% Moisture: not dec. Date Analyzed: 10/19/89

Column: (pack/cap) CAP Dilution Factor: 1.0

CONCENTRATION UNITS:

Number TICs found: 0 (ug/L or ug/Kg)UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
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IA
VOLATILE ORGANICS ANALYSIS DATA SHEET

SAMPLE NO.

Lab Name: Laucks Testing Labs

Contract: _____

428022

Bedoff

Lab Code: LAUCKS

Case No.: _____

SAS No. _____

SDG No.: 42802

Matrix: (soil/water)WATER

Lab Sample ID: 10122-03A

Sample wt/vol. 5.0 (g/ml)ML

Lab File ID: 10122V03

Level: (low/med) LOW

Date Received: 10/18/89

% Moisture: not dec. __

Date Analyzed: 10/19/89

Column: (pack/cap) CAP

Dilution Factor: 1

CONCENTRATION UNITS.
(ug/L or ug/Kg)UG/L Q

74-87-3	Chloromethane	10	U
74-83-9	Bromomethane	10	U
75-01-4	Vinyl Chloride	10	U
75-00-0	Chloroethane	10	U
75-09-2	Methylene Chloride	5	U
67-64-1	Acetone	10	U
75-15-0	Carbon Disulfide	5	U
75-35-4	1,1-Dichloroethene	5	U
75-34-3	1,1-Dichloroethane	5	U
540-59-0	1,2-Dichloroethene (total)	5	U
67-66-3	Chloroform	5	U
107-05-2	1,2-Dichloroethane	5	U
73-93-0	2-Butanone	10	U
71-55-6	1,1,1-Trichloroethane	5	U
56-23-5	Carbon Tetrachloride	5	U
108-05-4	Vinyl Acetate	10	U
75-27-4	Bromodichloromethane	5	U
78-87-5	1,2-Dichloropropane	5	U
10061-01-5	cis-1,3-Dichloropropene	5	U
79-01-6	Trichloroethene	5	U
124-48-1	Oibromochloromethane	5	U
79-00-5	1,1,2-Trichloroethane	5	U
71-43-2	Benzene	5	U
10061-02-6	Trans-1,3-Dichloropropene	5	U
75-25-2	Bromoform	5	U
103-10-1	4-Methyl-2-Pentanone	10	U
591-78-8	2-Hexanone	10	U
127-13-4	Tetrachloroethene	5	U
79-34-5	1,1,2,2-Tetrachloroethane	5	U
108-88-3	Toluene	5	U
108-90-7	Chlorobenzene	5	U
100-41-4	Ethylbenzene	5	U
100-42-5	Styrene	5	U
1330-20-7	Xylene (total)	5	U

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

SAMPLE NO.

Lab Name: Laucks Testing Labs Contract: _____

428022

Bedoff

Lab Code: LAUCKS Case No.: _____ SAS No.: _____ SDC No.: 42802

Matrix: (soil/water)WATER Lab Sample ID: 10122-03A

Sample wt/vol: 5.0 (g/ml)ML Lab File ID: 10122V03

Level: (low/med) LOW Date Received: 10/18/89

% Moisture, not dec. __ Date Analyzed: 10/19/89

Column: (pack/cap) CAP Dilution Factor: 1.0

CONCENTRATION UNITS:

Number TICs found: 0 (ug/L or ug/Kg)UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
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1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

SAMPLE NO.

Lab Name: Laucks Testing Labs Contract: _____ | 428023

_____| Kyle

Lab Code: LAUCKS Case No.: _____ SAS No.: _____ SDG No.: 42802

Matrix: (soil/water)WATER Lab Sample ID: 10122-04A

Sample wt/vol: 5.0 (g/ml)ML Lab File ID: 10122V04

Level: (low/med) LOW Date Received: 10/18/89

Moisture: not dec. Date Analyzed: 10/18/89

Column: (pack/cap) CAP Dilution Factor: 1

CONCENTRATION UNITS:

(ug/L or ug/Kg)UG/L

Q

74-87-0	Chloromethane	10	U
74-83-8	Bromomethane	10	U
75-01-4	Vinyl Chloride	10	U
75-00-3	Chloroethane	10	U
75-09-2	Methylene Chloride	5	U
67-64-1	Acetone	10	U
75-15-0	Carbon Disulfide	5	U
75-35-4	1,1-Dichloroethene	5	U
75-34-3	1,1-Dichloroethane	5	U
540-59-0	1,2-Dichloroethene (total)	5	U
67-66-3	Chloroform	5	U
107-06-2	1,2-Dichloroethane	5	U
78-93-2	2-Butanone	10	U
71-55-6	1,1,1-Trichloroethane	5	U
55-20-5	Carbon Tetrachloride	5	U
108-05-4	Vinyl Acetate	10	U
75-27-4	Bromodichloromethane	5	U
78-37-5	1,2-Dichloropropane	5	U
10061-01-5	cis-1,3-Dichloropropene	5	U
79-01-6	Trichloroethene	5	U
124-48-1	Dibromochloromethane	5	U
79-00-5	1,1,2-Trichloroethane	5	U
71-43-2	Benzene	5	U
10061-02-6	Trans-1,3-Dichloropropene	5	U
75-25-2	Bromoform	5	U
108-10-1	4-Methyl-2-Pentanone	10	U
591-78-6	2-Hexanone	10	U
127-18-4	Tetrachloroethene	5	U
73-04-5	1,1,2,2-Tetrachloroethane	5	U
108-88-3	Toluene	5	U
108-90-7	Chlorobenzene	5	U
100-41-4	Ethylbenzene	5	U
100-42-5	Styrene	5	U
1330-20-7	Xylene (total)	5	U

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

SAMPLE NO.

Lab Name: Laucks Testing Labs

Contract: _____

428023

Kyle

Lab Code: LAUCKS

Case No.: _____

SAS No.: _____

SDG No.: 42802

Matrix: (soil/water)WATER

Lab Sample ID: 10122-04A

Sample wt/vol: 5.0 (g/ml)ML

Lab File ID: 10122V04

Level: (low/med) LOW

Date Received: 10/18/89

% Moisture: not dec. __

Date Analyzed: 10/19/89

Column: (pack/cap) CAP

Dilution Factor: 1.0

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg)UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
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1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

SAMPLE NO.

Lab Name. Laucks Testing Labs Contract: _____ | 428024 |
_____| Homala |

Lab Code. LAUCKS Case No.: _____ SAS No. _____ SOG No.: 42802

Matrix: (soil/water)WATER Lab Sample ID: 10122-05A

Sample wt/vol: 5.0 (g/ml)ML Lab File ID: 10122V05

Level: (low/med) LOW Date Received: 10/18/89

% Moisture: not dec. ____ Date Analyzed: 10/19/89

Column: (pack/cap) CAP Dilution Factor: 1

CAS NO.	COMPOUND	CONCENTRATION UNITS:	
		(ug/L or ug/Kg)	UG/L Q
74-87-0	-Chloromethane	10	U
74-83-9	-Bromomethane	10	U
75-01-4	-Vinyl Chloride	10	U
75-30-3	-Chloroethane	10	U
75-09-2	-Methylene Chloride	5	U
67-64-1	-Acetone	10	U
75-15-0	-Carbon Disulfide	5	U
75-35-4	-1,1-Dichloroethene	5	U
75-34-3	-1,1-Dichloroethane	5	U
540-59-0	-1,2-Dichloroethene (total)	5	U
67-66-3	-Chloroform	5	U
107-06-2	-1,2-Dichloroethane	5	U
73-93-3	-2-Butanone	10	U
71-55-6	-1,1,1-Trichloroethane	5	U
56-23-3	-Carbon Tetrachloride	5	U
108-05-4	-Vinyl Acetate	10	U
75-27-4	-Bromodichloromethane	5	U
78-87-5	-1,2-Dichloropropane	5	U
10061-01-5	-cis-1,3-Dichloropropene	5	U
73-01-6	-Trichloroethene	5	U
124-48-1	-Dibromochloromethane	5	U
73-00-5	-1,1,2-Trichloroethane	5	U
71-43-2	-Benzene	5	U
10061-02-5	-Trans-1,3-Dichloropropene	5	U
75-25-2	-Bromoform	5	U
108-10-1	-4-Methyl-2-Pentanone	10	U
591-78-8	-2-Hexanone	10	U
127-18-4	-Tetrachloroethene	5	U
79-34-5	-1,1,2,2-Tetrachloroethane	5	U
108-80-3	-Toluene	5	U
108-90-7	-Chlorobenzene	5	U
100-41-4	-Ethylbenzene	5	U
100-42-5	-Styrene	5	U
1330-20-7	-Xylene (total)	5	U

15
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

SAMPLE NO.

Lab Name: Laucks Testing Labs Contract: _____ | 428024 | Homala |

Lab Code: LAUCKS Case No.: _____ SAC No.: _____ SOC No.: 42802

Matrix: (soil/water)WATER Lab Sample ID: 10122-05A

Sample wt/vol. 5.0 (g/ml)ML Lab File ID: 10122V05

Level: (low/med) LOW Date Received: 10/18/89

% Moisture: not dec. Date Analyzed: 10/19/89

Column: (pack/cap) CAP Dilution Factor: 1.0

CONCENTRATION UNITS:

(ug/L or ug/Kg)UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
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1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

SAMPLE NO.

Lab Name. Laucks Testing Labs Contract. _____ | 420025
 Lab Code. LAUCKS Case No.: _____ | Dup. (Tm)
 Matrix: (soil/water)WATER Lab Sample ID: 10122-06A
 Sample wt/vol. 5.0 (g/ml)ML Lab File ID: 10122V06
 Level: (low/med) LOW Date Received: 10/18/89
 % Moisture. not dec. ____ Date Analyzed: 10/19/89
 Column: (pack/cap) CAP Dilution Factor: 1

CAS NO.	COMPOUND	CONCENTRATION UNITS:	
		(ug/L or ug/Kg)	UG/L Q
74-87-3	Chloromethane	10	U
74-83-9	Bromomethane	10	U
75-01-4	Vinyl Chloride	10	U
75-00-3	Chloroethane	10	U
75-09-2	Methylene Chloride	5	U
67-64-1	Acetone	10	U
75-15-0	Carbon Disulfide	5	U
75-05-4	1,1-Dichloroethene	5	U
75-34-3	1,1-Dichloroethane	5	U
540-59-0	1,2-Dichloroethene (total)	5	U
67-96-3	Chloroform	5	U
107-06-2	1,2-Dichloroethane	5	U
78-90-0	2-Butanone	10	U
71-55-6	1,1,1-Trichloroethane	5	U
58-20-5	Carbon Tetrachloride	5	U
108-05-4	Vinyl Acetate	10	U
75-27-4	Bromodichloromethane	5	U
78-37-5	1,2-Dichloropropane	5	U
10061-01-5	cis-1,3-Dichloropropene	5	U
79-01-6	Trichloroethene	5	U
124-48-1	Dibromochloromethane	5	U
79-00-5	1,1,2-Trichloroethane	5	U
71-43-2	Benzene	5	U
10061-02-6	Trans-1,3-Dichloropropene	5	U
75-25-2	Bromoform	5	U
103-10-1	4-Methyl-2-Pentanone	10	U
591-78-6	2-Hexanone	10	U
127-13-4	Tetrachloroethene	5	U
79-34-5	1,1,2,2-Tetrachloroethane	5	U
108-88-3	Toluene	5	U
108-90-7	Chlorobenzene	5	U
100-41-4	Ethylbenzene	5	U
100-42-5	Styrene	5	U
1330-20-7	Xylene (total)	5	U

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

SAMPLE NO.

Lab Name:	Laucks Testing Labs	Contract:	420026
Lab Code:	LAUCKS	Case No.:	SOG No..
Matrix: (soil/water)WATER		Lab Sample ID: 10122-06A	
Sample wt/vol.	5.0 (g/ml)ML	Lab File ID:	10122V06
Level:	(low/med) LOW	Date Received:	10/18/89
% Moisture:	not dec.	Date Analyzed:	10/19/89
Column:	(pack/cap) CAP	Dilution Factor:	1.0

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg)UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
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1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

SAMPLE NO.

Lab Name: Laucks Testing Labs Contract: _____ 428027 Transport
 Lab Code: LAUCKS Case No.: _____ SAS No. _____ SOD No. 42802
 Matrix: (soil/water)WATER Lab Sample ID: 10122-07A
 Sample wt/vol: 5.0 (g/ml)ML Lab File ID: 10122V07
 Level: (low/med) LOW Date Received: 10/18/89
 % Moisture: not dec. Date Analyzed: 10/19/89
 Column: (pack/cap) CAP Dilution Factor: 1

CAS NO.	COMPOUND	CONCENTRATION UNITS:	
		(ug/L or ug/Kg)UG/L	Q
74-87-0	Chloromethane	10	U
74-83-9	Bromomethane	10	U
75-01-4	Vinyl Chloride	10	U
75-60-0	Chloroethane	10	U
75-09-2	Methylene Chloride	1	J
67-64-1	Acetone	10	U
75-15-0	Carbon Disulfide	5	U
75-35-4	1,1-Dichloroethene	5	U
75-34-3	1,1-Dichloroethane	5	U
540-59-0	1,2-Dichloroethene (total)	5	U
67-66-3	Chloroform	5	U
107-06-2	1,2-Dichloroethane	5	U
78-63-0	2-Butanone	10	U
71-55-6	1,1,1-Trichloroethane	5	U
56-23-5	Carbon Tetrachloride	5	U
103-05-4	Vinyl Acetate	10	U
75-27-4	Bromodichloromethane	5	U
78-87-5	1,2-Dichloropropane	5	U
10061-01-5	cis-1,3-Dichloropropene	5	U
79-01-6	Trichloroethene	5	U
124-48-1	Dibromochloromethane	5	U
79-00-5	1,1,2-Trichloroethane	5	U
71-43-2	Benzene	5	U
10061-02-6	Trans-1,3-Dichloropropene	5	U
75-25-2	Bromoform	5	U
108-10-1	4-Methyl-2-Pentanone	10	U
591-78-6	2-Hexanone	10	U
127-10-4	Tetrachloroethene	5	U
79-34-5	1,1,2,2-Tetrachloroethane	5	U
108-88-3	Toluene	5	U
108-90-7	Chlorobenzene	5	U
100-41-4	Ethylbenzene	5	U
100-42-5	Styrene	5	U
1330-20-7	Xylene (total)	5	U

IE
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

SAMPLE NO.

Lab Name:	Laucks Testing Labs	Contract:	428027
Lab Code:	LAUCKS	Case No.:	SAS No.: 42902
Matrix:	(soil/water)WATER	Lab Sample ID: 10122-07A	
Sample wt/vol.	5.0 (g/ml)ML	Lab File ID: 10122V07	
Level:	(low/med) LOW	Date Received: 10/18/09	
% Moisture:	not dec.	Date Analyzed: 10/19/09	
Column:	(pack/cap) CAP	Dilution Factor: 1.0	

CONCENTRATION UNITS:
(ug/L or ug/Kg)UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
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IA
VOLATILE ORGANIC ANALYSIS DATA SHEET

SAMPLE NO.

Lab Name: Laucks Testing Labs

Contract: _____

VOLKJ1

Lab Code: LAUCKS Case No.: _____

SAS No. _____ SDG No..42802

Matrix: (soil/water)WATER

Lab Sample ID: B1013MVOWJ1

Sample wt/vol: 5.0 (g/ml)ML

Lab File ID. B1013MVOWJ1

Level: (low/med) LOW

Date Received: 10/18/89

% Moisture: not dec. __

Date Analyzed: 10/19/89

Column: (pack/cap) CAP

Dilution Factor: 1

CAS NO.	COMPOUND	CONCENTRATION UNITS:	
		(ug/L or ug/Kg)	UG/L Q
74-87-3	-Chloromethane	10	U
74-83-9	-Bromomethane	10	U
75-01-4	-Vinyl Chloride	10	U
75-00-0	-Chloroethane	10	U
75-09-2	-Methylene Chloride	5	U
57-64-1	-Acetone	10	U
75-15-0	-Carbon Disulfide	5	U
75-35-4	-1,1-Dichloroethene	5	U
75-34-3	-1,1-Dichloroethane	5	U
540-59-0	-1,2-Dichloroethene (total)	5	U
67-66-3	-Chloroform	5	U
107-06-2	-1,2-Dichloroethane	5	U
78-93-0	-2-Butanone	10	U
71-55-6	-1,1,1-Trichloroethane	5	U
58-20-5	-Carbon Tetrachloride	5	U
100-05-4	-Vinyl Acetate	10	U
75-27-4	-Bromodichloromethane	5	U
78-37-5	-1,2-Dichloroproppane	5	U
10061-01-5	-cis-1,3-Dichloropropene	5	U
73-01-6	-Trichloroethene	5	U
124-48-1	-Dibromochloromethane	5	U
73-00-5	-1,1,2-Trichloroethane	5	U
71-43-2	-Benzene	5	U
10061-02-6	-Trans-1,3-Dichloropropene	5	U
75-25-2	-Bromoform	5	U
103-10-1	-4-Methyl-2-Pentanone	10	U
591-78-6	-2-Hexanone	10	U
127-18-4	-Tetrachloroethene	5	U
79-04-5	-1,1,2,2-Tetrachloroethane	5	U
103-88-3	-Toluene	5	U
100-90-7	-Chlorobenzene	5	U
100-41-4	-Ethylbenzene	5	U
100-42-5	-Styrene	5	U
1030-20-7	-Xylene (total)	5	U

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

SAMPLE NO.

VBLKJ1

Lab Name: Laucks Testing Labs Contract: _____

Lab Code: LAUCKS Case No.: _____ SAS No.: _____ SDG No.: 42802

Matrix: (soil/water)WATER Lab Sample ID: 81019MVOWJ1

Sample wt/vol: 5.0 (g/ml)ML Lab File ID: 81019MVOWJ1

Level: (low/med) LOW Date Received: 10/18/89

% Moisture: not dec. Date Analyzed: 10/19/89

Column: (pack/cap) CAP Dilution Factor: 1.0

CONCENTRATION UNITS:

Number TICs found: 0 (ug/L or ug/Kg)UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
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1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

SAMPLE NO.

428020MS

Lab Name: Laucks Testing Labs Contract: _____
 Lab Code: LAUCKS Case No.: _____ SAS No. _____ SOG No.: 42802
 Matrix: (soil/water)WATER Lab Sample ID: 10122-04AMS
 Sample wt/vol: 5.0 (g/ml)ML Lab File ID: 10122V04MS
 Level: (low/med) LOW Date Received: 10/18/89
 % Moisture: not dec. ____ Date Analyzed: 10/19/89
 Column: (pack/cap) CAP Dilution Factor: 1

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg)UG/L	Q
74-87-3	-Chloromethane	10 U	
74-83-9	-Bromomethane	10 U	
75-01-4	-Vinyl Chloride	10 U	
75-00-0	-Chloroethane	10 U	
75-09-2	-Methylene Chloride	5 U	
67-64-1	-Acetone	10 U	
75-15-6	-Carbon Disulfide	5 U	
75-05-4	-1,1-Dichloroethene	5 U	
75-34-0	-1,1-Dichloroethane	5 U	
540-59-0	-1,2-Dichloroethane (total)	5 U	
67-68-3	-Chloroform	5 U	
107-06-2	-1,2-Dichloroethane	5 U	
70-90-0	-2-Butanone	10 U	
71-55-3	-1,1,1-Trichloroethane	5 U	
56-20-5	-Carbon Tetrachloride	5 U	
108-05-4	-Vinyl Acetate	10 U	
75-27-4	-Bromodichloromethane	5 U	
73-87-5	-1,2-Dichloropropane	5 U	
10061-01-5	-cis-1,3-Dichloropropene	5 U	
79-01-6	-Trichloroethene	5 U	
124-48-1	-Dibromochloromethane	5 U	
79-00-5	-1,1,2-Trichloroethane	5 U	
71-43-2	-Benzene	5 U	
10061-02-6	-Trans-1,3-Dichloropropene	5 U	
75-25-2	-Bromoform	5 U	
108-10-1	-4-Methyl-2-Pentanone	10 U	
591-70-6	-2-Hexanone	10 U	
127-18-4	-Tetrachloroethene	5 U	
79-34-5	-1,1,2,2-Tetrachloroethane	5 U	
103-88-3	-Toluene	5 U	
108-90-7	-Chlorobenzene	5 U	
100-41-4	-Ethylbenzene	5 U	
100-42-5	-Styrene	5 U	
1030-20-7	-Xylene (total)	5 U	

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

SAMPLE NO.

428023MSD

Lab Name: Laucks Testing Labs Contract: _____

Lab Code: LAUCKS Case No.: _____ SAS No. _____ SOC No.: 42802

Matrix: (soil/water)WATER Lab Sample ID: 10122-04AMSD

Sample wt/vol: 5.0 (g/ml)ML Lab File ID: 10122V04MSD

Level: (low/med) LOW Date Received: 10/18/89

% Moisture: not dec. Date Analyzed: 10/19/89

Column: (pack/cap) CAP Dilution Factor: 1

CONCENTRATION UNITS:
(ug/L or ug/Kg)UG/L Q

74-87-3	-Chloromethane	10	U
74-83-9	-Bromomethane	10	U
75-01-4	-Vinyl Chloride	10	U
75-00-3	-Chloroethane	10	U
75-09-2	-Methylene Chloride	5	U
67-64-1	-Acetone	10	U
75-15-0	-Carbon Disulfide	5	U
75-35-4	-1,1-Dichloroethane	5	U
75-34-3	-1,1-Dichloroethane	5	U
540-59-0	-1,2-Dichloroethene (total)	5	U
67-66-0	-Chloroform	5	U
107-06-2	-1,2-Dichloroethane	5	U
70-93-0	-2-Butanone	10	U
71-55-6	-1,1,1-Trichloroethane	5	U
56-20-5	-Carbon Tetrachloride	5	U
100-05-4	-Vinyl Acetate	10	U
75-27-4	-Bromodichloromethane	5	U
78-37-5	-1,2-Dichloropropane	5	U
10061-01-5	-cis-1,3-Dichloropropene	5	U
79-01-6	-Trichloroethene	5	U
124-48-1	-Dibromochloromethane	5	U
79-00-5	-1,1,2-Trichloroethane	5	U
71-43-2	-Benzene	5	U
10061-02-6	-Trans-1,3-Dichloropropene	5	U
75-25-2	-Bromoform	5	U
108-10-1	-4-Methyl-2-Pentanone	10	U
591-78-6	-2-Hexanone	10	U
127-18-4	-Tetrachloroethene	5	U
79-34-5	-1,1,2,2-Tetrachloroethane	5	U
108-88-3	-Toluene	5	U
108-90-7	-Chlorobenzene	5	U
100-41-4	-Ethylbenzene	5	U
100-42-5	-Styrene	5	U
1330-20-7	-Xylene (total)	5	U

Project: DOE-0081 TOFTDAHL DRUM SITE

Laboratory: Ecology, Manchester

Sample No: 89 428020

Description: BOONE

Begin Date: 89/10/16 :

	Gen Inorg/Phys-Speci	Water-Total		B/N/Acid Scan		Water-Total		B/N/Acid Scan		Water-Total	
		Result	Units	Result	Units	Result	Units	Result	Units	Result	Units
Cyanide	Total	0.0020	mg/l	N-Nitrosodiphenylamine	REQ	Chrysene	REQ	4,6-Dinitro-2-methylnaph-	REQ		
Metals - PP	Water-Total			Fluorene	REQ	1,3-Dichlorobenzene	REQ				
	Result	Units		Hexachlorobutadiene	REQ	2,6-Dinitrotoluene	REQ				
				Pentachlorophenol	REQ	N-Nitroso-di-n-Propyl-	REQ				
Arsenic	As-Total	REQ	ug/l	2,4,6-Trichlorophenol	REQ	4-Chlorophenyl-phenyle-	REQ				
Lead	Pb-Total	REQ	ug/l	2-Nitroaniline	REQ	bis(2-Chloroisopropyl)+	REQ				
Thallium	Tl-Total	REQ	ug/l	Naphthalene	REQ						
Nickel	Ni-Total	REQ	ug/l	2-Methylnaphthalene	REQ						
Silver	Ag-Total	REQ	ug/l	2-Chloronaphthalene	REQ						
Antimony	Sb-Total	REQ	ug/l	3,3'-Dichlorobenzidine	REQ						
Selenium	Se-Total	REQ	ug/l	2-Methylphenol	REQ	4,4'-DDT	0.0033U	ug/1			
Mercury	Hg-Total	REQ	ug/l	1,2-Dichlorobenzene	REQ	Chlordane	0.0033U	ug/1			
Metals - ICP Scan	Water-Total			o-Chlorophenol	REQ	gamma-BHC (Lindane)	0.0033U	ug/1			
	Result	Units		2,4,5-Trichlorophenol	REQ	Dieldrin	0.0033U	ug/1			
Beryllium	Be-Total	REQ	ug/l	Nitrobenzene	REQ	Endrin	0.0066U	ug/1			
Cadmium	Cd-Total	REQ	ug/l	3-Nitroaniline	REQ	Methoxychlor	0.0033U	ug/1			
Chromium	Cr-Total	REQ	ug/l	4-Nitroaniline	REQ	4,4'-DDD	0.0033U	ug/1			
Copper	Cu-Total	REQ	ug/l	4-Nitrophenol	REQ	Heptachlor	0.0033U	ug/1			
Lead	Pb-Total	REQ	ug/l	Benzyl Alcohol	REQ	4,4'-DDE	0.0033U	ug/1			
Nickel	Ni-Total	REQ	ug/l	4-Bromophenyl-phenylet+	REQ	Aldrin	0.0033U	ug/1			
Zinc	Zn-Total	REQ	ug/l	2,4-Dimethylphenol	REQ	alpha-BHC	0.0033U	ug/1			
B/N/ Acid Scan	Water-Total			4-Methylphenol	REQ	beta-BHC	0.0033U	ug/1			
	Result	Units		1,4-Dichlorobenzene	REQ	delta-BHC	0.0033U	ug/1			
				4-Chloroaniline	REQ	alpha-Endosulfan	0.0033U	ug/1			
				Phenol	REQ	Heptachlor epoxide	0.0033U	ug/1			
				bis(2-Chloroethyl)Ether	REQ	Endosulfan sulfate	0.0033U	ug/1			
				bis(2-Chloroethoxy)Met+	REQ	Endrin aldehyde	0.0033U	ug/1			
				BIS(2-ETHYLHEXYL) PHTH+	REQ	Toxaphene	0.09U	ug/1			
				Di-n-Octyl Phthalate	REQ	PCB - 1016	0.03U	ug/1			
				Hexachlorobenzene	REQ	PCB - 1254	0.03U	ug/1			
				Anthracene	REQ	PCB - 1221	0.03U	ug/1			
				1,2,4-Trichlorobenzene	REQ	PCB - 1232	0.03U	ug/1			
				Benz(a,h)anthracene	REQ	PCB - 1248	0.03U	ug/1			
				4-Chloro-3-Methylphenol	REQ	PCB - 1248	0.03U	ug/1			
				Benzocaine	REQ	beta-Endosulfan	0.03U	ug/1			
				2,4-Dinitrophenol	REQ	PCB - 1242	0.03U	ug/1			
				Isophorone	REQ	IntStd: Hexabromobenzen	89	% Recov			
				Acenaphthene	REQ	PCB - 1242	0.03U	ug/1			
				Diethylphthalate	REQ	IntStd: 4,4-Dibromoocet	55	% Recov			
				Isophorone	REQ						
				Di-n-Butylphthalate	REQ						
				Phenanthrene	REQ						
				Butylbenzylphthalate	REQ						
				Acenaphthylene	REQ						

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Washington State Department of Ecology
Sample/Project Analysis Results

Page 2

Project: DOE-0081 TOFTDAHL DRUM SITE

Laboratory: Ecology, Manchester

Sample No: 89 428020

Description: BOONE

Begin Date: 89/10/16 :

Contract Lab Program	Water-Totals	Result Units	
VOA	GC/MS	REQ	CLP

Source: Well (Drinking Water Supply)

Officer: LZC

Account: D3P01

(Sample Complete)

Project: DOE-008I TOFTDAHL DRUM SITE

Officer: LZC Account: D3P01

Laboratory: Ecology, Manchester

Sample No: 89 428021 Description: TOM

Begin Date: 89/10/16 :

Source: Well (Drinking Water Supply)

		Water-Total		B/N/Acid Scan *** Continued ***		B/N/Acid Scan *** Continued ***		Water-Total		Chrysene	
		Result	Units	Result	Units	Result	Units	Result	Units	Result	Units
Cyanide	Total	0.002U	mg/1								
Gen Inorg/Phys-Speci	Water-Total										
Metals - PP	Water-Total										
	Result										
Arsenic	As-Total	REQ	ug/1	N-Nitrosodiphenylamine		REQ		4,6-Dinitro-2-methylph+		REQ	
Lead	Pb-Total	REQ	ug/1	Fluorene		REQ		1,3-Dichlorobenzene		REQ	
Thallium	Tl-Total	REQ	ug/1	Hexachlorobutadiene		REQ		2,6-Dinitrotoluene		REQ	
Nickel	Ni-Total	REQ	ug/1	Pentachlorophenol		REQ		N-Nitroso-di-n-Propylat+		REQ	
Silver	Ag-Total	REQ	ug/1	2,4,6-Trichlorophenol		REQ		4-Chlorophenyl-Phenyle+		REQ	
Antimony	Sb-Total	REQ	ug/1	2-Nitroaniline		REQ		bis(2-Chloroisopropyl)+			
Selenium	Se-Total	REQ	ug/1	2-Methylnaphthalene		REQ					
Mercury	Hg-Total	REQ	ug/1	2-Chloronaphthalene		REQ					
Metals - ICP Scan	Water-Total										
	Result										
Beryllium	Be-Total	REQ	ug/1	3,3'-Dichlorobenzidine		REQ		4,4'-DDT		0.003U	ug/1
Cadmium	Cd-Total	REQ	ug/1	2-Methylphenol		REQ		Chlordane		0.003U	ug/1
Chromium	Cr-Total	REQ	ug/1	1,2-Dichlorobenzene		REQ		gamma-BHC (Lindane)		0.003U	ug/1
Copper	Cu-Total	REQ	ug/1	o-Chlorophenol		REQ		Dieldrin		0.003U	ug/1
Lead	Pb-Total	REQ	ug/1	2,4,5-Trichlorophenol		REQ		Endrin		0.003U	ug/1
Nickel	Ni-Total	REQ	ug/1	Nitrobenzene		REQ		Methoxychlor		0.006U	ug/1
Zinc	Zn-Total	REQ	ug/1	3-Nitroaniline		REQ		4,4'-DDD		0.003U	ug/1
B/N/Acid Scan	Water-Total			4-Nitroaniline		REQ		Heptachlor		0.003U	ug/1
	Result			4-Nitrophenol		REQ		Aldrin		0.003U	ug/1
Benz(a)pyrene	REQ			Benzyl Alcohol		REQ		alpha-BHC		0.003U	ug/1
2,4-Dinitrophenol	REQ			4-Bromophenyl-Phenyle+		REQ		beta-BHC		0.003U	ug/1
Dibenzo(a,h)anthracene	REQ			2,4-Dimethylphenol		REQ		delta-BHC		0.003U	ug/1
Benz(a)anthracene	REQ			4-Methylphenol		REQ		alpha-Endosulfan		0.003U	ug/1
4-Chloro-3-Methylphenol	REQ			1,4-Dichlorobenzene		REQ		Heptachlor epoxide		0.003U	ug/1
Benzoic acid	REQ			Di-n-Octyl Phthalate		REQ		Endosulfan sulfate		0.003U	ug/1
Hexachloroethane	REQ			Hexachlorobenzene		REQ		Endrin aldehyde		0.003U	ug/1
Hexachlorocyclopentadi-	REQ			Anthracene		REQ		Toxaphene		0.009U	ug/1
IsoPhorone	REQ			1,2,4-Trichlorobenzene		REQ		PCB - 1260		0.03U	ug/1
Acenaphthene	REQ			2,4-Dichlorophenol		REQ		PCB - 1254		0.03U	ug/1
Diethylphthalate	REQ			2,4-Dichlorophenol		REQ		PCB - 1221		0.03U	ug/1
Di-n-Butylphthalate	REQ			2,4-Dimethylphenol		REQ		PCB - 1232		0.03U	ug/1
Phenanthrene	REQ			Pyrene		REQ		PCB - 1248		0.03U	ug/1
Benzo(k)fluoranthene	REQ			Dimethylphthalate		REQ		PCB - 1016		0.03U	ug/1
Acenaphthylene	REQ			Dibenzofuran		REQ		beta-Endosulfan		0.003U	ug/1
				Benzo(g,h,i)perylene		REQ		PCB - 1242		0.03U	ug/1
				Indeno(1,2,3-cd)pyrene		REQ		Intstd: Hexabromobenzene		0.03U	ug/1
				Benzo(b)fluoranthene		REQ		Intstd: 4,4-Dibromoocct+		0.03U	ug/1
				Fluoranthene		REQ		Intstd: 4,4-Dibromoocct+		0.03U	ug/1
				Benzo(k)fluoranthene		REQ		Intstd: 4,4-Dibromoocct+		0.03U	ug/1
				Butylbenzylphthalate		REQ		Intstd: Hexabromobenzene		0.03U	ug/1

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Washington State Department of Ecology
Sample/Project Analysis Results

Page 4
Officer: LZC Account: D3P01

Project: DOE-008I TOFTDAHL DRUM SITE

Laboratory: Ecology, Manchester

Sample No: 89 428021

Description: TOM

Begin Date: 89/10/16 :

Contract Lab Program	Water-Totals	Result	Units
VOA	GC/MS	REQ	CLP

Source: Well (Drinking Water Supply)

(Sample Complete)

Project: DOE-0081 TOFTDAHL DRUM SITE

Officer: LZC Account: D3P01

Laboratory: Ecology, Manchester

Sample No: 89 428022 Description: BEDOFF

Begin Date: 89/10/16 :

Source: Woll (Drinking Water Supply)

Gen Inorg/Phys-Speci		Water-Total	B/N/Acid Scan	Water-Total	B/N/Acid Scan	Water-Total	B/N/Acid Scan	Water-Total
Cyanide	Total	0.002U mg/1	Result	Units	Result	Units	Result	Units
Metals - PP			Water-Total		***	Continued ***	***	Continued ***
			Result	Units			Result	Units
Arsenic	As-Total	REQ	ug/1					
Lead	Pb-Total	REQ	ug/1					
Thallium	Tl-Total	REQ	ug/1					
Nickel	Ni-Total	REQ	ug/1					
Silver	Ag-Total	REQ	ug/1					
Antimony	Sb-Total	REQ	ug/1					
Selenium	Se-Total	REQ	ug/1					
Mercury	Hg-Total	REQ	ug/1					
Metals - ICP Scan			Water-Total					
			Result	Units				
Beryllium	Be-Total	REQ	ug/1					
Cadmium	Cd-Total	REQ	ug/1					
Chromium	Cr-Total	REQ	ug/1					
COPPER	Cu-Total	REQ	ug/1					
Lead	Pb-Total	REQ	ug/1					
Nickel	Ni-Total	REQ	ug/1					
Zinc	Zn-Total	REQ	ug/1					
B/N/Acid Scan			Water-Total					
			Result	Units				
Gen Inorg/Phys-Speci			Water-Total					
			Result	Units				
Metals - PP			Water-Total					
			Result	Units				
Arachene	REQ							
Anthracene	REQ							
1,2,4-Trichlorobenzene	REQ							
2,4-Dichlorophenol	REQ							
2,4-Dinitrotoluene	REQ							
Hexachlorobenzene	REQ							
2,4-Dinitrophenol	REQ							
Dibenzo(a,h)anthracene	REQ							
Benz(a)anthracene	REQ							
4-Chloro-3-Methylphenol	REQ							
Benzoic acid	REQ							
Hexachloroethane	REQ							
Hexachlorocyclopentadi-	REQ							
Isophorone	REQ							
Acenaphthene	REQ							
Diethylphthalate	REQ							
Di-n-Butylphthalate	REQ							
Phenanthrene	REQ							
Butylbenzylphthalate	REQ							
Chrysene	REQ							
4,6-Dinitro-2-methylph+	REQ							
1,3-Dichlorobenzene	REQ							
2,6-Dinitrotoluene	REQ							
N-Nitroso-di-n-Propyl-	REQ							
4-Chlorophenyl-phenyle+	REQ							
bis(2-Chloroisopropyl)+	REQ							
Pest/PCB - PP Scan			Water-Total					
			Result	Units				
4,4'-DDT	0.004U ug/1							
Chlordane	0.004U ug/1							
Gamma-BHC (Lindane)	0.004U ug/1							
Dieldrin	0.004U ug/1							
Endrin	0.004U ug/1							
Methoxychlor	0.008U ug/1							
4,4'-DDD	0.004U ug/1							
4,4'-DDE	0.004U ug/1							
Heptachlor	0.004U ug/1							
Aldrin	0.004U ug/1							
alpha-BHC	0.004U ug/1							
beta-BHC	0.004U ug/1							
delta-BHC	0.004U ug/1							
alpha-Endosulfan	0.004U ug/1							
Heptachlor epoxide	0.004U ug/1							
Endosulfan sulfate	0.004U ug/1							
Endrin aldehyde	0.004U ug/1							
Toxaphene	0.12U ug/1							
bis(2-Chloroethyl)Ether	0.004U ug/1							
bis(2-Chloroethoxy)Met+	0.004U ug/1							
BIS(2-ETHYLHEXYL) PHTH+	0.004U ug/1							
Di-n-Octyl Phthalate	0.004U ug/1							
Hexachlorobenzene	0.004U ug/1							
2,4-Dinitrophenol	0.004U ug/1							
Dibenzo(a,h)anthracene	0.004U ug/1							
Benz(a)anthracene	0.004U ug/1							
1,2,4-Trichlorobenzene	0.004U ug/1							
2,4-Dichlorophenol	0.004U ug/1							
2,4-Dinitrotoluene	0.004U ug/1							
Hexachlorobenzene	0.004U ug/1							
2,4-Dinitrophenol	0.004U ug/1							
Dibenzo(a,h)anthracene	0.004U ug/1							
Benz(a)anthracene	0.004U ug/1							
1,2,4-Trichlorobenzene	0.004U ug/1							
2,4-Dichlorophenol	0.004U ug/1							
2,4-Dinitrotoluene	0.004U ug/1							
Pyrene	0.04U ug/1							
Dimethylphthalate	0.004U ug/1							
Dibenzofuran	0.04U ug/1							
Benz(ghi)perylene	0.04U ug/1							
Indeno(1,2,3-cd)Pyrene	0.04U ug/1							
Benzo(b)fluoranthene	0.04U ug/1							
Fluoranthene	0.04U ug/1							
Benzo(k)fluoranthene	0.04U ug/1							
Acenaphthylene	0.04U ug/1							
Intstd: Hexabromobenzoate	94	\$ Recov						
Intstd: 4,4-Dibromoocet+	52	\$ Recov						

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Washington State Department of Ecology
Sample/Project Analysis Results

Project: DOE-0081 TOFTDAHL DRUM SITE

Laboratory: Ecology, Manchester

Sample No: 89 428022

Description: BEDOFF

Begin Date: 89/10/16 :

Post/PCB - PP Scan		Water-Total		Contract Lab Program		Water-Total	
Matrix Spike #1	Result Units	Result	Units	Result	Units	Result	Units
4,4'-DDT	51	% Recov		VOA	GC/MS	REQ	CLP
Chlordane	NOT SPIKD	% Recov					
Gamma-BHC (Lindane)	86	% Recov					
Dieldrin	52	% Recov					
Endrin	48	% Recov					
Methoxychlor	51	% Recov					
4,4'-DDD	52	% Recov					
4,4'-DDE	51	% Recov					
Heptachlor	67	% Recov					
Aldrin	60	% Recov					
alpha-BHC	54	% Recov					
beta-BHC	95	% Recov					
delta-BHC	74	% Recov					
alpha-Endosulfan	56	% Recov					
Heptachlor epoxide	62	% Recov					
Endosulfan sulfate	51	% Recov					
Endrin aldehyde	47	% Recov					
beta-Endosulfan	54	% Recov					
IntStd: Hexabromobenzene	87	% Recov					
IntStd: 4,4-Dibromoocet+	75	% Recov					
4,4'-DDT	57	% Recov					
Chlordane	NOT SPIKD	% Recov					
Gamma-BHC (Lindane)	96	% Recov					
Dieldrin	96	% Recov					
Endrin	52	% Recov					
Methoxychlor	61	% Recov					
4,4'-DDD	63	% Recov					
4,4'-DDE	62	% Recov					
Heptachlor	81	% Recov					
Aldrin	67	% Recov					
alpha-BHC	66	% Recov					
beta-BHC	103	% Recov					
delta-BHC	80	% Recov					
alpha-Endosulfan	61	% Recov					
Heptachlor epoxide	66	% Recov					
Endosulfan sulfate	56	% Recov					
Endrin aldehyde	44	% Recov					
beta-Endosulfan	77	% Recov					
IntStd: Hexabromobenzene	102	% Recov					
IntStd: 4,4-Dibromoocet+	101	% Recov					

(Sample Complete)

Project: DOE-0081 TOFTDAHL DRUM SITE

Officer: LZC

Account: D3P01

Laboratory: Ecology, Manchester

Sample No: 89 428023

Description: KYLE

Begin Date: 89/10/16 :

Source: Well (Drinking Water Supply)

		Water-Total		B/N/Acid Scan		Water-Total		B/N/Acid Scan		Water-Total		
	Speci	Result	Units		***	Continued		***	Continued		Result	Units
Cyanide	Total	0.002U	mg/l	N-Nitrosodiphenylamine	REQ		Chrysene	REQ		4,6-Dinitro-2-methylph+	REQ	
				Fluorene	REQ		1,3-Dichlorobenzene	REQ		2,6-Dinitrotoluene	REQ	
Metals - PP	Water-Total			Hexachlorobutadiene	REQ		N-Nitroso-di-n-Propylat	REQ		4-Chlorophenyl-Phenyle+	REQ	
	Result			Pentachlorophenol	REQ		bis(2-Chloroisopropyl)+	REQ				
	Units			2,4,6-Trichlorophenol	REQ							
Arsenic	As-Total	REQ	ug/l	2-Nitrophenol	REQ							
Lead	Pb-Total	REQ	ug/l	Naphthalene	REQ							
Thallium	Tl-Total	REQ	ug/l	2-Methylnaphthalene	REQ							
Nickel	Ni-Total	REQ	ug/l	2-Chloronaphthalene	REQ							
Silver	Ag-Total	REQ	ug/l	3,3'-Dichlorobenzidine	REQ							
Antimony	Sb-Total	REQ	ug/l	2-Methylphenol	REQ							
Selenium	Se-Total	REQ	ug/l	1,2-Dichlorobenzene	REQ							
Mercury	Hg-Total	REQ	ug/l	o-Chlorophenol	REQ							
				2,4,5-Trichlorophenol	REQ							
Metals - ICP Scan	Water-Total			Nitrobenzene	REQ							
	Result			3-Nitroaniline	REQ							
	Units			4-Nitroaniline	REQ							
Beryllium	Be-Total	REQ	ug/l	Benzyl Alcohol	REQ							
Cadmium	Cd-Total	REQ	ug/l	4-Bromophenyl-phenylet+	REQ							
Chromium	Cr-Total	REQ	ug/l	2,4-Dimethylphenol	REQ							
Copper	Cu-Total	REQ	ug/l	4-Methylphenol	REQ							
Lead	Pb-Total	REQ	ug/l	1,4-Dichlorobenzene	REQ							
Nickel	Ni-Total	REQ	ug/l	4-Chloroaniline	REQ							
Zinc	Zn-Total	REQ	ug/l	Phenol	REQ							
				bis(2-Chloroethyl)Ether	REQ							
B/N/Acid Scan	Water-Total			bis(2-Chloroethoxy)Me+	REQ							
	Result			BIS(2-ETHYLHEXYL) PHTH+	REQ							
	Units			Di-n-Octyl Phthalate	REQ							
				Hexachlorobenzene	REQ							
				Anthracene	REQ							
				1,2,4-Trichlorobenzene	REQ							
				2,4-Dichlorophenol	REQ							
				2,4-Dinitrotoluene	REQ							
				Pyrene	REQ							
				Dimethylphthalate	REQ							
				Dibenzofuran	REQ							
				Benz(ghi)Perylene	REQ							
				Indeno(1,2,3-cd)Pyrone	REQ							
				Benzo(b)fluoranthene	REQ							
				Fluoranthene	REQ							
				Benzo(k)fluoranthene	REQ							
				Acenaphthylene	REQ							
				Acenaphthene	REQ							
				Diethylphthalate	REQ							
				Di-n-Butylphthalate	REQ							
				Phenanthrene	REQ							
				Butylbenzylphthalate	REQ							

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Washington State Department of Ecology
Sample/Project Analysis Results

Page 8
Project: DOE-008I TOFTDAHL DRUM SITE
Officer: LZC Account: D3P01

Laboratory: Ecology, Manchester

Sample No: 89 428023 Description: KYLE

Begin Date: 89/10/16 :

Contract Lab Program	Water-Total	Result Units	Units
VOA	GC/MS	REQ	CLP

Source: Well (Drinking Water Supply)

(Sample Complete)

Project: DOE-008I TOFTDAHL DRUM SITE

Laboratory: Ecology, Manchester

Sample No: 89 428024 Description: HOMALA

Begin Date: 89/10/16 :

Source: Well (Drinking Water Supply)

Officer: LZC

Account: D3P01

Gen Inorg/Phys-Speci				Water-Total				B/N/Acid Scan				Water-Total			
Metals - PP		Water-Total		Result Units		Result Units		B/N/Acid Scan		*** Continued ***		B/N/Acid Scan		Water-Total	
Metals - ICP Scan		Water-Total		Result Units		Result Units		B/N/Acid Scan		*** Continued ***		B/N/Acid Scan		Water-Total	
Cyanide	Total	0.002U	mg/l												
Arsenic	As-Total	REQ	ug/l	N-Nitrosodiphenylamine	REQ			Chrysene	REQ						
Lead	Pb-Total	REQ	ug/l	Fluorene	REQ			4,6-Dinitro-2-methylph+	REQ						
Thallium	Tl-Total	REQ	ug/l	Hexachlorobutadiene	REQ			1,3-Dichlorobenzene	REQ						
Nickel	Ni-Total	REQ	ug/l	Pentachlorophenol	REQ			2,6-Dinitrotoluene	REQ						
Silver	Ag-Total	REQ	ug/l	2,4,6-Trichlorophenol	REQ			N-Nitroso-di-n-Propyl+	REQ						
Antimony	Sb-Total	REQ	ug/l	2-Nitroaniline	REQ			4-Chlorophenyl-Phenyle+	REQ						
Selenium	Se-Total	REQ	ug/l	2-Nitrophenol	REQ			bis(2-Chloroisopropyl)+	REQ						
Mercury	Hg-Total	REQ	ug/l	Naphthalene	REQ										
Beryllium	Be-Total	REQ	ug/l	2-Methylnaphthalene	REQ										
Cadmium	Cd-Total	REQ	ug/l	2-Chloronaphthalene	REQ										
Chromium	Cr-Total	REQ	ug/l	3,3'-Dichlorobenzidine	REQ			4,4'-DDT	0.003U						
Copper	Cu-Total	REQ	ug/l	1,2-Dichlorobenzene	REQ			Chlordane	0.003U						
Lead	Pb-Total	REQ	ug/l	o-Chlorophenol	REQ			gamma-BHC (Lindane)	0.003U						
Nickel	Ni-Total	REQ	ug/l	2,4,5-Trichlorophenol	REQ			Dieldrin	0.003U						
Zinc	Zn-Total	REQ	ug/l	Nitrobenzene	REQ			Methoxychlor	0.006U						
				3-Nitroaniline	REQ			4,4'-DDD	0.003U						
				4-Nitroaniline	REQ			Heptachlor	0.003U						
				4-Nitrophenol	REQ			Aldrin	0.003U						
				Benzy1 Alcohol	REQ			alpha-BHC	0.003U						
				4-Bromophenyl-Phenyle+	REQ			beta-BHC	0.003U						
				2,4-Dimethylphenol	REQ			delta-BHC	0.003U						
				4-Methylphenol	REQ			alpha-Endosulfan	0.003U						
				1,4-Dichlorobenzene	REQ			Heptachlor epoxide	0.003U						
				4-Chloroaniline	REQ			Endosulfan sulfate	0.003U						
				Phenol	REQ			Endrin aldehyde	0.003U						
				bis(2-Chloroethyl) Ether	REQ			Toxaphene	0.09U						
				bis(2-Chloroethoxy) Met+	REQ			PCB - 1260	0.03U						
				BIS(2-ETHYLHEXYL) PHTH+	REQ			PCB - 1254	0.03U						
				Di-n-Octyl Phthalate	REQ			PCB - 1221	0.03U						
				Hexachlorobenzene	REQ			PCB - 1232	0.03U						
				Anthracene	REQ			PCB - 1248	0.03U						
				1,2,4-Trichlorobenzene	REQ			PCB - 1016	0.03U						
				2,4-Dichlorophenol	REQ			beta-Endosulfan	0.003U						
				Pyrene	REQ			PCB - 1242	0.03U						
				Dimethylphthalate	REQ			IntStd: Hexabromobenzene	90						
				Dibenzofuran	REQ			IntStd: 4,4-Dibromoocct+	54						
				Isophorone	REQ			% Recov	54						
				Acenaphthene	REQ										
				Diethylphthalate	REQ										
				Di-n-Butylphthalate	REQ										
				Phenanthrene	REQ										
				Benzo(k)fluoranthene	REQ										
				Acenaphthylene	REQ										

(Continued on next page)

5-DEC-89
09:23:42

Washington State Department of Ecology
Sample/Project Analysis Results

Page 10

Project: DOE-008I TOFTDAHL DRUM SITE

Laboratory: Ecology, Manchester

Sample No: 89 428024

Description: HOMALA

Begin Date: 89/10/16 :

Contract Lab Program	Water-Total	Result	Units
VOA	GC/MS	REQ	CLP

Account: D3PP01

Officer: LZC

Source: Well (Drinking Water Supply)

(Sample Complete)

5-DEC-89
09:23:42Washington State Department of Ecology
Sample/Project Analysis Results

Project: DOE-0081 TOFTDAHL DRUM SITE

Laboratory: Ecology, Manchester

Sample No: 89 428025

Description: GINTER

Begin Date: 89/10/16 :

Metals - PP	Water-Totals	Result	Units
Arsenic As-Total	REQ	ug/1	
Lead Pb-Total	REQ	ug/1	
Thallium Tl-Total	REQ	ug/1	
Nickel Ni-Total	REQ	ug/1	
Silver Ag-Total	REQ	ug/1	
Antimony Sb-Total	REQ	ug/1	
Selenium Se-Total	REQ	ug/1	
Mercury Hg-Total	REQ	ug/1	

Metals - ICP Scan	Water-Totals	Result	Units
Beryllium Be-Total	REQ	ug/1	
Cadmium Cd-Total	REQ	ug/1	
Chromium Cr-Total	REQ	ug/1	
Copper Cu-Total	REQ	ug/1	
Lead Pb-Total	REQ	ug/1	
Nickel Ni-Total	REQ	ug/1	
Zinc Zn-Total	REQ	ug/1	

Source: Well (Drinking Water Supply)

Officer: LZC

Account: D3P01

(Sample Complete)

Project: DOE-008I TOFTDAHL DRUM SITE

Laboratory: Ecology, Manchester

Sample No: 89 428026

Description: EAST

Begin Date: 89/10/16 :

Source: Well (Drinking Water Supply)					
Water-Total					
B/N/Acid Scan *** Continued ***					
		Result	Units	Result	Units
Gen Inorg/Phys-Speci	Water-Total				
	Result				
	Units				
Metals - PP	Water-Total				
	Result				
	Units				
Cyanide Total	0.002U	m g/1			
Gen Inorg/Phys-Speci	Water-Total				
	Result				
	Units				
Metals - PP	Water-Total				
	Result				
	Units				
Arsenic As-Total	REQ	ug/1			
Lead Pb-Total	REQ	ug/1			
Thallium Tl-Total	REQ	ug/1			
Nickel Ni-Total	REQ	ug/1			
Silver Ag-Total	REQ	ug/1			
Antimony Sb-Total	REQ	ug/1			
Selenium Se-Total	REQ	ug/1			
Mercury Hg-Total	REQ	ug/1			
Metals - ICP Scan	Water-Total				
	Result				
	Units				
Beryllium Be-Total	REQ	ug/1			
Cadmium Cd-Total	REQ	ug/1			
Chromium Cr-Total	REQ	ug/1			
Copper Cu-Total	REQ	ug/1			
Lead Pb-Total	REQ	ug/1			
Nickel Ni-Total	REQ	ug/1			
Zinc Zn-Total	REQ	ug/1			
B/N/Acid Scan	Water-Total				
	Result				
	Units				
(a)Pyrene	REQ				
2,4-Dinitrophenol	REQ				
Dibenzo(a,h)anthracene	REQ				
Benzo(a)anthracene	REQ				
4-Chloro-3-Methylphenol	REQ				
Benzonic acid	REQ				
Hexachloroethane	REQ				
Hexachlorocyclopentadi-	REQ				
Isophorone	REQ				
Acenaphthene	REQ				
Diethylphthalate	REQ				
Di-n-Butylphthalate	REQ				
Phenanthrene	REQ				
Phenylbenzylphthalate	REQ				
Acenaphthylene	REQ				
Chrysene	REQ				
4,6-Dinitro-2-methylph+	REQ				
1,3-Dichlorobenzene	REQ				
2,6-Dinitrotoluene	REQ				
N-Nitroso-di-n-Propyl+	REQ				
4-Chlorophenyl-phenyle+	REQ				
bis(2-Chloroisopropyl)+	REQ				
Pest/PCB - PP Scan	Water-Total				
	Result				
	Units				
4,4'-DDT	0.003U	ug/1			
Chlordane	0.003U	ug/1			
Gamma-BHC (Lindane)	0.003U	ug/1			
Dieldrin	0.003U	ug/1			
Endrin	0.006U	ug/1			
Methoxychlor	0.003U	ug/1			
4,4'-DDD	0.003U	ug/1			
4,4'-DDF	0.003U	ug/1			
Heptachlor	0.003U	ug/1			
Aldrin	0.003U	ug/1			
Alpha-BHC	0.003U	ug/1			
beta-BHC	0.003U	ug/1			
delta-BHC	0.003U	ug/1			
alpha-Endosulfan	0.003U	ug/1			
Heptachlor epoxide	0.003U	ug/1			
Endosulfan sulfate	0.003U	ug/1			
Endrin aldehyde	0.003U	ug/1			
Toxaphene	0.003U	ug/1			
bis(2-Chloroethyl)Ether	PCB - 1260				
bis(2-Chloroethoxy)Meth	PCB - 1254				
BIS(2-ETHYLHEXYL) PHTH+	PCB - 1221				
Di-n-Octyl Phthalate	PCB - 1232				
Hexachlorobenzene	PCB - 1248				
Anthracene	PCB - 1016				
1,2,4-Trichlorobenzene	PCB - 1016				
2,4-Dichlorophenol	PCB - 1232				
Pyrene	PCB - 1242				
Dimethylphthalate	PCB - 1242				
Dibenzofuran	PCB - 1242				
Benzo(ghi)Perylene	PCB - 1242				
Indeno(1,2,3-cd)Pyrene	PCB - 1242				
Benzo(b)fluoranthene	PCB - 1242				
Fluoranthene	PCB - 1242				
Benzo(k)fluoranthene	PCB - 1242				
Acenaphthylene	PCB - 1242				
Intstd: 4,4-Dibromoocyt+	84	\$ Recov			
	53	\$ Recov			

(Continued on next page)

Washington State Department of Ecology
Sample/Project Analysis Results

5-DEC-89
09:23:42 Project: DOE-0081 TOFTDAHL DRUM SITE

Laboratory: Ecology, Manchester

Sample No: 89 428026 Description: EAST

Begin Date: 89/10/16 :

Contract Lab Program	Water-Total	Result	Units
VOA	GC/MS	REQ	CLP

Officer: LZC Account: D3P01

Source: Well (Drinking Water Supply)

(Sample Complete)

Project: DOE-0081 TOFTDAHL DRUM SITE

Laboratory: Ecology, Manchester

Officer: LZC Account: D3P01

Sample No: 89 428027 Description: TRANSPOR

Begin Date: 89/10/16 :

		B/N/Acid Scan			Water-Total			B/N/Acid Scan			Water-Total		
		*** Continued			Result Units			*** Continued			Result Units		
Metals - PP		Water-Total			Water-Total			Water-Total			Water-Total		
		Result	Units		Result	Units		Result	Units		Result	Units	
Arsenic	As-Total	REQ	ug/1	+ 2-Nitrophenol	REQ		+ bis(2-Chloroisopropyl) +	REQ		+ 4,4'-DDT	0.003 U	ug/1	
	Pb-Total	REQ	ug/1	Naphthalene	REQ		Chlordane	0.003 U	ug/1	Benzyl Alcohol	0.003 U	ug/1	
Thallium	Tl-Total	REQ	ug/1	2-Methylnaphthalene	REQ		Gamma-BHC (Lindane)	0.003 U	ug/1	alpha-BHC	0.003 U	ug/1	
Nickel	Ni-Total	REQ	ug/1	2-Chloronaphthalene	REQ		delta-BHC	0.003 U	ug/1	beta-BHC	0.003 U	ug/1	
Silver	Ag-Total	REQ	ug/1	3,3'-Dichlorobenzidine	REQ		gamma-BHC	0.003 U	ug/1	alpha-ECD	0.003 U	ug/1	
Antimony	Sb-Total	REQ	ug/1	2-Methylphenol	REQ		beta-ECD	0.003 U	ug/1	beta-ECD	0.003 U	ug/1	
Selenium	Se-Total	REQ	ug/1	1,2-Dichlorobenzene	REQ		gamma-ECD	0.003 U	ug/1	gamma-ECD	0.003 U	ug/1	
Mercury	Hg-Total	REQ	ug/1	o-Chlorophenol	REQ		delta-ECD	0.003 U	ug/1	delta-ECD	0.003 U	ug/1	
Metals - ICP Scan		Water-Total		+ 2,4,5-Trichlorophenol	REQ		alpha-Endosulfan	0.003 U	ug/1	alpha-Endosulfan	0.003 U	ug/1	
		Result	Units	Nitrobenzenes	REQ		beta-Endosulfan	0.003 U	ug/1	beta-Endosulfan	0.003 U	ug/1	
Beryllium	Be-Total	REQ	ug/1	3-Nitroaniline	REQ		gamma-Endosulfan	0.003 U	ug/1	gamma-Endosulfan	0.003 U	ug/1	
Cadmium	Cd-Total	REQ	ug/1	4-Nitroaniline	REQ		delta-Endosulfan	0.003 U	ug/1	delta-Endosulfan	0.003 U	ug/1	
Chromium	Cr-Total	REQ	ug/1	Benzyl Alcohol	REQ		Heptachlor	0.003 U	ug/1	Heptachlor	0.003 U	ug/1	
Copper	Cu-Total	REQ	ug/1	4-Bromophenyl-phenylet+	REQ		Aldrin	0.003 U	ug/1	Aldrin	0.003 U	ug/1	
	Pb-Total	REQ	ug/1	2,4-Dimethylphenol	REQ		alpha-BHC	0.003 U	ug/1	alpha-BHC	0.003 U	ug/1	
Lead		REQ	ug/1	4-Methylphenol	REQ		beta-BHC	0.003 U	ug/1	beta-BHC	0.003 U	ug/1	
Nickel	Ni-Total	REQ	ug/1	1,4-Dichlorobenzene	REQ		delta-BHC	0.003 U	ug/1	delta-BHC	0.003 U	ug/1	
Zinc	Zn-Total	REQ	ug/1	4-Chloroaniline	REQ		alpha-Endosulfan	0.003 U	ug/1	alpha-Endosulfan	0.003 U	ug/1	
		Phenol		Phenol	REQ		Heptachlor epoxide	0.003 U	ug/1	Heptachlor epoxide	0.003 U	ug/1	
				bis(2-Chloroethyl) Ether	REQ		Endosulfan sulfate	0.003 U	ug/1	Endosulfan sulfate	0.003 U	ug/1	
				bis(2-Chloroethoxy) Met+	REQ		Endrin aldehyde	0.003 U	ug/1	Endrin aldehyde	0.003 U	ug/1	
				BIS(2-ETHYLHEXYL) PHTH+	REQ		Toxaphene	0.003 U	ug/1	Toxaphene	0.003 U	ug/1	
				Di-n-Octyl Phthalate	REQ		PCB - 1260	0.003 U	ug/1	PCB - 1260	0.003 U	ug/1	
				Hexachlorobenzene	REQ		PCB - 1254	0.003 U	ug/1	PCB - 1254	0.003 U	ug/1	
				Anthracene	REQ		PCB - 1221	0.003 U	ug/1	PCB - 1221	0.003 U	ug/1	
				2,4-Dinitrobenzene	REQ		PCB - 1232	0.003 U	ug/1	PCB - 1232	0.003 U	ug/1	
				2,4-Dichlorophenol	REQ		PCB - 1248	0.003 U	ug/1	PCB - 1248	0.003 U	ug/1	
				2,4-Dinitrotoluene	REQ		PCB - 1016	0.003 U	ug/1	beta-Endosulfan	0.003 U	ug/1	
				Pyrene	REQ		PCB - 1242	0.003 U	ug/1	beta-Endosulfan	0.003 U	ug/1	
				Dimethylphthalate	REQ		PCB - 1242	0.003 U	ug/1	PCB - 1242	0.003 U	ug/1	
				Dibenzofuran	REQ		IntStd: Hexabromobenzene	90	% Recov	IntStd: Hexabromobenzene	90	% Recov	
				Indeno(1,2,3-cd)Pyrene	REQ		IntStd: 4,4-Dibromooc+	56	% Recov	IntStd: 4,4-Dibromooc+	56	% Recov	
				Indeno(1,2,3-cd)Pyrene	REQ		VOA	GC/MS	CLP	VOA	GC/MS	CLP	
				Benzo(b)fluoranthene	REQ		Contract Lab Program			Contract Lab Program			
				Fluoranthene	REQ		Water-Total			Water-Total			
				Benzo(k)fluoranthene	REQ		Result	Units		Result	Units		
				Acenaphthylene	REQ								
				Chrysene	REQ								
				4,6-Dinitro-2-methylph+	REQ								
				1,3-Dichlorobenzene	REQ								
				2,6-Dinitrotoluene	REQ								
				N-Nitroso-di-n-Propyl-	REQ								
				4-Chlorophenyl-phenylet+	REQ								
				2-Nitroaniline	REQ								

(Sample Complete)

Project: DOE-0081 TOFTDAHL DRUM SITE

Blank ID: BW9292

Officer: LZC

Account: D3P01

	Pest/PCB - PP Scan	Water-Total Result	Units
Blank #1			
4,4'-DDT	0 .010U	ug/1	
Chlordane	0 .010U	ug/1	
gamma-BHC (Lindane)	0 .010U	ug/1	
Dieldrin	0 .010U	ug/1	
Endrin	0 .010U	ug/1	
Methoxychlor	0 .020U	ug/1	
4,4'-DDD	0 .010U	ug/1	
4,4'-DDE	0 .010U	ug/1	
Heptachlor	0 .010U	ug/1	
Aldrin	0 .010U	ug/1	
alpha-BHC	0 .010U	ug/1	
beta-BHC	0 .010U	ug/1	
delta-BHC	0 .010U	ug/1	
alpha-Endosulfan	0 .010U	ug/1	
Heptachlor epoxide	0 .010U	ug/1	
Endosulfan sulfate	0 .010U	ug/1	
Endrin aldehyde	0 .010U	ug/1	
Toxaphene	0 .900U	ug/1	
PCB - 1260	0 .10U	ug/1	
PCB - 1254	0 .10U	ug/1	
PCB - 1221	0 .10U	ug/1	
PCB - 1232	0 .10U	ug/1	
PCB - 1248	0 .10U	ug/1	
PCB - 1016	0 .10U	ug/1	
beta-Endosulfan	0 .010U	ug/1	
PCB - 1242	0 .10U	ug/1	
IntStd: Hexabromobenzene	80	% Recov	
IntStd: 4,4-Dibromoocetate	38	% Recov	

(Sample Complete)

WASHINGTON STATE DEPARTMENT OF ECOLOGY
MANCHESTER ENVIRONMENTAL LABORATORY
P.O. Box 307, Manchester, WA 98353

DATA REVIEW

February 13, 1990

PROJECT: Toftdahl

SAMPLE NO: 428020 - 428027 PP Metals

LABORATORY: Columbia Analytical
1317 S. 13th Avenue
Kelso, WA 98626

By: Craig Smith, Chemist

Metals

Holding time: Analyses for all parameters were performed within the holding time limits.

Reagent Blank: The reagent blank for water showed no detectable analytes for the desired metals.

Matrix Spike: The targeted accuracy of matrix spikes is +/- 25% of the true value.

All values were within the specified limits.

Laboratory Control Sample: The target is a +/- 20% recovery control limit.

Sample Duplicate: The target limits are +/- 20%, or +/- 1 detection limit. Duplicate results were within the target control limits.

Sample Data: The data is acceptable for use without further qualification.

Mercury Results

	Sample Number	Result (ug/L)
Boone	428020	0.060 U
Jam	428021	0.060 U
Bidoff	428022	0.060 U
Kyle	428023	0.10
Homala	428024	0.16
Ginter	428025	0.060 U
East	428026	0.060 U
Transport	428027	0.22
	428021 spike(1.0ppb)	100% recovery
	428021 dup spike	106% recovery

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

CLIENT: Washington State/Dept. of Ecology
 SUBMITTED BY: Craig Smith
 PROJECT: Toftdahl
 SAMPLE DESCRIPTION: Water

DATE RECEIVED: 01/23/90
 WORK ORDER #: K90225

Total Priority Pollutant Metals
 mg/L

Sample Name:		<u>Down</u> 428020 <u>225-1</u>	<u>Jom</u> 428021 <u>225-2</u>	<u>Bedo ff</u> 428022 <u>225-3</u>
Lab Code:	<u>Method</u>	<u>MRL</u>		
Antimony	200.7	0.05	ND	ND
Arsenic	206.2	0.005	ND	ND
Beryllium	200.7	0.005	ND	ND
Cadmium	200.7	0.002	ND	ND
Chromium	200.7	0.005	ND	ND
Copper	200.7	0.01	0.05	0.01
Lead	239.2	0.002	ND	ND
Nickel	200.7	0.02	ND	ND
Selenium	270.2	0.005	ND	ND
Silver	200.7	0.01	ND	ND
Thallium	279.1	0.005	ND	ND
Zinc	200.7	0.01	0.29	0.01

ND means None Detected at or above MRL
 MRL means Method Reporting Limit

Approved by Mike Shelton Date 2/8/90

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

CLIENT: Washington State/Dept. of Ecology
SUBMITTED BY: Craig Smith
PROJECT: Toftdahl
SAMPLE DESCRIPTION: Water

DATE RECEIVED: 01/23/90
WORK ORDER #: K90225

Total Priority Pollutant Metals
mg/L

Sample Name:		Kyle	Bonala	Ginter
Lab Code:		428023 <u>225-4</u>	428024 <u>225-5</u>	428025 <u>225-6</u>
	<u>Method</u>	<u>MRL</u>		
Antimony	200.7	0.05	ND	ND
Arsenic	206.2	0.005	ND	ND
Beryllium	200.7	0.005	ND	ND
Cadmium	200.7	0.002	ND	ND
Chromium	200.7	0.005	ND	ND
Copper	200.7	0.01	0.03	ND
Lead	239.2	0.002	ND	ND
Nickel	200.7	0.02	ND	ND
Selenium	270.2	0.005	ND	ND
Silver	200.7	0.01	ND	ND
Thallium	279.1	0.005	ND	ND
Zinc	200.7	0.01	0.02	0.02

ND means None Detected at or above MRL

MRL means Method Reporting Limit

Approved by Mike Shelton Date 2/8/90

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

CLIENT: Washington State/Dept. of Ecology
SUBMITTED BY: Craig Smith
PROJECT: Toftdahl
SAMPLE DESCRIPTION: Water

DATE RECEIVED: 01/23/90
WORK ORDER #: K90225

Total Priority Pollutant Metals
mg/L

Sample Name:		<i>East</i>	<i>Transport</i>
Lab Code:		428026	428027
	<u>Method</u>	<u>MRL</u>	<u>225-8</u>
Antimony	200.7	0.05	ND
Arsenic	206.2	0.005	ND
Beryllium	200.7	0.005	ND
Cadmium	200.7	0.002	ND
Chromium	200.7	0.005	ND
Copper	200.7	0.01	ND
Lead	239.2	0.002	ND
Nickel	200.7	0.02	ND
Selenium	270.2	0.005	ND
Silver	200.7	0.01	ND
Thallium	279.1	0.005	ND
Zinc	200.7	0.01	0.02

ND means None Detected at or above MRL

MRL means Method Reporting Limit

Approved by Mike Helton Date 2/8/90

COLUMBIA ANALYTICAL SERVICES, INC.

CLIENT: Washington State/Dept. of Ecology
 SUBMITTED BY: Craig Smith
 PROJECT: Toftdahl
 SAMPLE DESCRIPTION: Water

DATE RECEIVED: 01/23/90
 WORK ORDER #: K90225

QA/QC Report
 Matrix Spike Results
 Total Priority Pollutants Metals
 mg/L

Sample Name: 428020
 Lab Code: 225-1MS

<u>Element</u>	<u>Spike Level</u>	<u>MRL</u>	<u>Sample Result</u>	<u>Spike Result</u>	<u>% Recovery</u>
Antimony	0.5	0.05	ND	0.52	104
Arsenic	0.04	0.005	ND	0.041	103
Beryllium	0.05	0.005	ND	0.053	106
Cadmium	0.05	0.002	ND	0.059	118
Chromium	0.2	0.005	ND	0.216	108
Copper	0.25	0.01	0.05	0.29	96
Lead	0.02	0.002	ND	0.017	85
Nickel	0.5	0.02	ND	0.53	106
Selenium	0.01	0.005	ND	0.009	90
Silver	0.05	0.01	ND	0.044	88
Thallium	0.05	0.005	ND	0.048	96
Zinc	0.5	0.01	0.29	0.81	104

ND means None Detected at or above MRL
 MRL means Method Reporting Limit

Approved by Mike Shelton Date 2/8/90

COLUMBIA ANALYTICAL SERVICES, INC.

CLIENT: Washington State/Dept. of Ecology
 SUBMITTED BY: Craig Smith
 PROJECT: Toftdahl
 SAMPLE DESCRIPTION: Water

DATE RECEIVED: 01/23/90
 WORK ORDER #: K90225

QA/QC Report
 Duplicate Matrix Spike Results
 Total Priority Pollutants Metals
 mg/L

Sample Name: 428020
 Lab Code: 225-1DMS

<u>Element</u>	<u>Spike Level</u>	<u>MRL</u>	<u>Sample Result</u>	<u>Spike Result</u>	<u>% Recovery</u>
Antimony	0.5	0.05	ND	0.51	102
Arsenic	0.04	0.005	ND	0.041	103
Beryllium	0.05	0.005	ND	0.053	106
Cadmium	0.05	0.002	ND	0.059	118
Chromium	0.2	0.005	ND	0.213	106
Copper	0.25	0.01	0.05	0.29	96
Lead	0.02	0.002	ND	0.017	85
Nickel	0.5	0.02	ND	0.53	106
Selenium	0.01	0.005	ND	0.009	90
Silver	0.05	0.01	ND	0.045	95
Thallium	0.05	0.005	ND	0.049	98
Zinc	0.5	0.01	0.29	0.81	104

ND means None Detected at or above MRL

MRL means Method Reporting Limit

Approved by Mike Stellon Date 2/8/90

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

CLIENT: Washington State/Dept. of Ecology
SUBMITTED BY: Craig Smith
PROJECT: Toftdahl
SAMPLE DESCRIPTION: Water

DATE RECEIVED: 01/23/90
WORK ORDER #: K90225

LCSW Metals
mg/L

Sample Name:

Lab Code:

	<u>Method</u>	<u>MRL</u>	<u>True</u>	<u>Found</u>	<u>% Recovery</u>
Antimony	200.7	0.05	0.98	1.06	108
Arsenic	206.2	0.005	0.094	0.099	105
Beryllium	200.7	0.005	0.483	0.472	98
Cadmium	200.7	0.002	0.502	0.501	100
Chromium	200.7	0.005	0.510	0.503	99
Copper	200.7	0.01	0.52	0.49	94
Lead	239.2	0.002	0.098	0.086	88
Nickel	200.7	0.02	0.48	0.48	100
Selenium	270.2	0.005	0.208	0.196	94
Silver	200.7	0.01	0.50	0.49	98
Thallium	279.1	0.005	0.097	0.095	98
Zinc	200.7	0.01	3.10	2.94	95

MRL means Method Reporting Limit

Approved by Mike Sheltor Date 2/18/90

COLUMBIA ANALYTICAL SERVICES, INC.

CLIENT: Washington State/Dept. of Ecology
SUBMITTED BY: Craig Smith
PROJECT: Toftdahl
SAMPLE DESCRIPTION: Water

DATE RECEIVED: 01/23/90
WORK ORDER #: K90225

QA/QC Report
Method Blank Summary
Total Priority Pollutant Metals
mg/L

Sample Name:

Method
Blank

	<u>Method</u>	<u>MRL</u>	<u>Method</u> <u>Blank</u>
Antimony	200.7	0.05	ND
Arsenic	206.2	0.005	ND
Beryllium	200.7	0.005	ND
Cadmium	200.7	0.002	ND
Chromium	200.7	0.005	ND
Copper	200.7	0.01	ND
Lead	239.2	0.002	ND
Nickel	200.7	0.02	ND
Selenium	270.2	0.005	ND
Silver	200.7	0.01	ND
Thallium	279.1	0.005	ND
Zinc	200.7	0.01	ND

ND means None Detected at or above MRL

MRL means Method Reporting Limit

Approved by Mike Phellon Date 2/23/90

22-OCT-89

Washington State Department of Ecology
*** Lab Analysis Report ***

Page 1

ransaction #: 10230940 Seq #: 01 (10) Gen Inorg/Phys-Specified
 roject: (DOE-008I) TOFTDAHL DRUM SITE (WE) Ecology, Manchester Lab
 aram: (720 S) Cyanide Total mg/l 27A42 LZC

QA Code: () Normal Data Partial
 Instrument: (TECH-2) Technicon (AAII) General
 Method: (EP1-335.3) Cyanide, (Total), Colorimetric, Automated
 Chemist: (CGT) Tupas, Cyma DOE Hours Worked:
 Lab Prep: () Unspecified
 Matrix: (10) Water-Total Date Preprd:
 Units: (10) mg/l Date Anlyzd: 891017

Line	Sample #	Result	Sample Location/Description	#Days to Anl
1	89 428020	0.002U	BOONE	891016 (1)
2	89 428021	0.002U	TOM	891016 (1)
3	89 428022	0.002U	BEDOFF	891016 (1)
4	89 428023	0.002U	KYLE	891016 (1)
5	89 428024	0.002U	HOMALA	891016 (1)
6	89 428026	0.002U	EAST	891016 (1)

Record Type: TRNIN2 Date Verified: 10/23/89 By: Shawn
 ransaction Status: New Transaction...First Printing...Unverified.
 rocessed: 23-OCT-89 09:43:19 Status: N Batch: (In CUR DB)